6IA.5
Ultrafine Particles Emitted from Microwave Popcorn. Qunfang Zhang, Jessica Avalos, YIFANG ZHU, *University of California, Los Angeles*

Microwave popcorn could release significant amounts of volatile organic compounds, particulate matter, and air toxics when popping and opening bags. This study was designed to characterize ultrafine particles (UFPs, diameter < 100 nm) emitted from microwave popcorn. A microwave oven was enclosed in a chamber with ports for air sampling and a fan to control air exchange rate inside the chamber. Pre-packed popcorn was cooked in the microwave oven while UFP size distribution and number concentration were measured. The popcorn tested in this study covered six different flavors. The UFP emission rates of microwave popcorn ranged from $1.2\times10^{1}1$ to $2.4\times10^{1}3$ particles/hour. The UFP size distributions were unimodal, with the mode around 40 nm for two flavors and around 80 nm for the others. The bag-to-bag variation of UFPs emitted by microwave popcorn was greater than the flavor-to-flavor variation, indicating limited influence of flavor on UFP emission rate. Foil-lined popcorn bags increased UFP emissions during popping by a factor of 2~13 compared with brown paper lunch bags, suggesting innovative package might reduce exposure to UFPs from microwave popcorn. UFP emission rates were slightly lower when cooking with a new microwave oven than a used oven, although not statistically significant. A positive relationship between UFP emission rate and power setting of microwave oven was observed.

6IA.6
HVAC Filters as Samplers of Particle-Bound Contaminants. JEFFREY SIEGEL, Kerry Kinney, *The University of Texas at Austin*

Heating, ventilation, and air conditioning (HVAC) filters are left in place for long periods of time and are subjected to large airflows. Filters in recirculating conditioning systems thus provide a temporally and spatially integrated sample of indoor particles. When combined with an in-situ filter efficiency measurement and an assessment of the total volume of air that flows through the filter, a compositional analysis of the dust can reveal a time-integrated estimate of particle-size and contaminant resolved particle concentrations. We have used this technique to assess DNA-based microbial contaminant levels as well as heavy metal concentrations. The results from these assessments suggest considerable variation amongst similar buildings and point to the limitations of both short-term air samples and settled-dust analysis. The purpose of this presentation is to explore both the value and the limitations of this HVAC filter-based technique as well as to extend the technique to other contaminants including allergens, SVOCs, viruses, and radionuclides. Issues of sensitivity, particle size associations, compositional changes in the dust while the filter is installed, and inhibition of DNA extraction are all explored. The results of this analysis suggest promise of the technique for many common indoor particles and further that it is most suited to contaminants that are stable and associated with super-micron particles. Systems with a long run-time and high filter efficiency are particularly suitable for this approach.

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